

This workshop introduces the development of model estimation data sets, the structures of the various model components, and the procedures for estimating models. At the end of the series, participants will be able to better manage model development done for them by others (e.g., consultants) and to understand and evaluate the results.

Questions and Answers during Session 6

Q: What would independent variables (IV) and dependent variables (DV) be in the cross classification model?

A: The IVs could be household size, number of autos, income, etc. The DVs would be trip productions.

Q: In the vehicle availability model, is there a typo in the coefficient value for the persons per household variable?

A: I assume you are talking about the coefficients for 2 and 3+ VA levels...this is not a typo, it's just the way the model was specified.

Q: Has there been any work done on change in auto ownership due to increase of transit services?

A: Very good question...this can be done by including accessibility variables such as employment within 15 minutes of transit service etc...The rationale is higher the accessibility by transit, lower the need for auto ownership. Another way to do this would be to include area type of residence. For example, people living in urban/CBD areas may find it less necessary to own vehicles.

Q: How often do you see non-linear transformations for cost? In these cases, how do you calculate VOT?

A: Cost/Income is a popular non-linear transformation. One of the homework has the exercise of calculating VOT with non-linear cost variables. Please see the homework solution to Session 4. If you have further questions on this, please let us know.

Q: Do you usually constrain attractions in a zone when applying destination choice model? How do you do that?

A: While applying destination choice models, you typically need proximity variables between the origin zone and the destination zone, the employment, population, area etc. for the destination zone. So, one can apply the probability expressions from the model, compute probabilities of choosing each destination from a given origin and finally, multiply the probabilities with the total trip productions to arrive at the trip interchanges between the origin and the destination zone

Q: So the destination choice model actually is applied in an aggregate way?

A: Yes, if you are using it in a four-step context.

Q: Isn't the likelihood function equal to the probability that the actually chosen mode is estimated to be chosen?

A: You are exactly right. What estimation software does is the following: it maximizes the choice probability of modes that have actually been chosen...let me know if this is not clear.

Q: Have you seen a utility value normalized by logsum parameter?

A: Yes, logsum parameters come into play when we have a nested model. For example, if you have a transit nest and an auto nest, then the estimation software will normalize the utilities of

the alternatives with the corresponding nesting parameter. This is all built into the estimation software.

Q: It seems, when I traced the logit model calculations it doesn't make sense to normalize utility value with logsum. I think this method is not because of software. I will ask the person why he made such calculation; I hope you can give me the insight.

A: When you say that the utility was normalized by logsum, do you mean this when the model was being applied? I can certainly give you more insight, but can you please provide some more details?

Q: Can you prevent trips to be over attracted to some TAZs when applying a destination choice model?

A: Excellent question...you can construct double constraints like you would with regular gravity models to take care of the over-attraction problem. In general, this is not a very big issue because destination choice models depend heavily on employment and population variables and over-attraction is taken care of implicitly.

Q: For example, utility value drive alone is normalized with logsum parameter of all auto.

A: Yes, this is because of the random utility theory. The normalization is necessary because the cross-elasticity of modes within a given nest is higher than it is for alternatives across nests. The normalization takes care of this. This is part of the random utility theory. I will try to address this verbally again.

Q: Thanks. How would you apply destination choice in a disaggregate context? Use Monte Carlo simulation?

A: We will answer this verbally.

Q: Can you suggest any books where these practice methods have been documented?

A: Frank S. Koppelman and Chandra Bhat, "A Self Instructing Course in Mode Choice Modeling: Multinomial and Nested Logit Models." We got the homework for Session 4 from this source.

Q: In the simulation for destination choice, do you simulate all destination zones or part of them? If part of them, how do you select sub-set of destination zones?

A: You can do it either way. The reason to limit it would be possibly to save computation time. You would set up rules based on what you observe in the survey data set. For example, you could set a maximum trip length.

Q: Can you please provide a written description for applying a destination choice in a 4-step process?

A: We will try to see if this description is readily available.

Q: The Houston Applications Conference will contain a presentation on the application of a destination choice model that is doubly-constrained (i.e., in the same style as a standard gravity model). The presentation is entitled "A New Technique for Destination Choice" and is scheduled for Tuesday afternoon.

A: Thanks! This will be very useful for our webinar participants.

Q: Here is a link to the referenced self-instructing course:

http://www.civil.northwestern.edu/people/koppelman/PDFs/LM_Draft_060131Final-060630.pdf.

A: Thank You! The link was also included in the footnote on Page 1 of Homework 4.

The FHWA Travel Model Improvement Program Workshop over the Web – Travel Model Estimation

Q: Does the destination choice model produce a better distribution result than the gravity model, in addition to those explanatory variables?

A: It would be interesting to compare the results of the destination choice and gravity models. But, I would say that destination choice models are indeed better because they are sensitive to congestion, employment changes and so forth.

DISCLAIMER

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